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Disparate radios create problem

Agencies can't communicate during crises, but fix not easy

By Paul Davidson,
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Quandry: Deputy David Hebert holds one of the St. Benard Parish Sheriff's Office two-way radios.

As chaos engulfed New Orleans after Hurricane Katrina struck, emergency responders traded urgent information in a way that was hardly a model of 21st-century high technology.

With floodwaters surging, they scurried on foot to ferry messages among city police, state troopers and the National Guard.

It's not that the agencies' radio systems didn't work. They just didn't work with each other.

The breakdown in New Orleans was the latest proof of a troubling quandary: Many of the USA's 50,000 public-safety agencies still can't talk to each other in a crisis. The problem has plagued emergency responders in every big disaster in recent memory — from the Oklahoma City bombing to 9/11 to Katrina.

The main culprit? Incompatible radio equipment.

"We didn't learn our lesson after the '93 World Trade Center bombing; we didn't learn our lesson after Sept. 11," Sen. Barbara Boxer, D-Calif., said at a Senate Commerce Committee hearing on Katrina. "We don't need anymore failures."

Yet there's no simple fix. Local agencies often lack the money and radio frequencies needed to upgrade equipment. And federal aid is sorely limited. Even with more money and frequencies, other hurdles thwart seamless communication among first responders:

• City, county, state and federal agencies buy radio equipment for their own needs. Turf battles often keep neighboring agencies from buying compatible gear, or even from teaming in an emergency. The federal government can't force all agencies in a state or region to buy the same gear.

• Safety agencies often fail to plan for interagency communication in disasters or to train officers in how to talk to their counterparts.

• Technology standards that would let disparate radio systems talk with each other have been delayed. Experts at least partly blame foot-dragging by radio manufacturers.

The upshot: Free-flowing communication among agencies in the USA won't come till 2023. At least that's the projection of Safecom, a program in the Homeland Security Department that promotes public-safety communication.

"It's going to take years to do it and a lot of money," says Harlin McEwen, who chairs the communications committee of the International Association of Chiefs of Police. "There isn't any magic bullet."

Congress is poised to take its most dramatic steps yet. It's expected to pass legislation that would give emergency responders more radio channels and money for new equipment. Yet emergency officials say the money is inadequate and the frequencies won't come soon enough.

Still, some areas of the country are attacking the problem, at least in a piecemeal way. Some are pursuing state or regional radio systems that counties or towns can join. Other areas have "gateways" that bridge disparate systems in emergencies. On the way: software-based radios that can span different radio networks.

"It's a big problem that's moving toward a solution quicker than we thought was possible a few years ago but slower than we would like," says David Boyd, who oversees radio compatibility at the Homeland Security Department.

The root of the problem is that radios on one frequency band typically can't talk to those on another. And radios made by different manufacturers are incompatible. Decades ago, agencies chose different channels from their neighbors to avoid interference. Manufacturers also built digital radios that had proprietary technology.

In a survey last year by the U.S. Conference of Mayors, 23% of local public-safety agencies said they couldn't communicate across their own police and fire departments. A third said they can't talk to the county sheriff. Most can't talk to state or federal agencies.

Those gaps can thwart teamwork during crises that draw multiple jurisdictions. A prime example: the 1999 Columbine school shootings in Colorado — where 46 agencies converged with mostly incompatible radio systems.

The most notorious breakdown occurred after the Sept. 11 terrorist attack on the World Trade Center. Police in helicopters couldn't warn firefighters of the imminent fall of the North Tower because the two agencies use different radio systems. More than 100 firefighters died when the tower fell.

Precious seconds

After the 1995 bombing in Oklahoma City, couriers had to carry messages by foot among state, county and city agencies that couldn't talk by radio.

Sometimes, responders relay messages through dispatchers, wasting precious seconds in an emergency.

Some cities use gateways that patch together different radio systems at disaster scenes by funneling the audio of one into the other. The devices cost as little as $10,000 — far less than the millions needed to replace a radio system. But gateways can be hard to set up on the fly. And they work only if the responding agencies have their own transmitter towers in the area.

"It's a stopgap," says John Powell of the National Public Safety Telecommunications Council.

The 2001 terrorist attacks spurred a call to fix the problem. Federal funding was boosted so state and local agencies could pay to upgrade walkie-talkie systems. But critics in Congress call the funding inadequate. It'll cost up to $60 billion to replace radio systems nationwide so agencies can talk to each other, Safecom has said.

Since 2003, the Justice Department has awarded $241 million to states and localities for such upgrades. Yet Congress slashed that funding to $10 million for 2006, from $93 million this year.

A separate Homeland Security grant provided about $7.3 billion for first responders. There's no mandate, though, that any of it pay for compatible radio networks. Just about $1.5 billion has gone toward that goal.

Rep. Bart Stupak, D-Mich., a former state trooper, faults the Bush administration for not dedicating more money to improved communication. "There's no leadership from the federal government," Stupak says. "All we get is a lot of talk."

In the administration's defense, Boyd says Homeland Security grants have risen sharply, from just $1 billion in the three years before 9/11. The department, he adds, doesn't want to dictate local spending decisions.

Another hurdle is a shortage of frequencies. Areas such as Los Angeles County would like to buy new radio systems in frequency bands used by neighboring agencies. Yet there are few available channels.

The federal government had been scheduled to reclaim a swath of analog channels for public safety from TV stations at the end of 2006, when the stations were to start broadcasting in digital-only. That shift, though, has been delayed to 2009 in legislation that sets aside $1 billion for new radio gear.

Some states, such as Alabama, Oklahoma and Mississippi, have tried to build radio systems to link state agencies and let local governments hook up, too. But the cost has proved too high.

Costs prove too high

A Mississippi network could cost $150 million to $300 million. "Astronomical," says Willie Huff of the state Transportation Department.

Even states that do build their own radio systems often can't persuade local agencies to tie in. Denver hasn't joined Colorado's Motorola system, which includes most of the state's localities. The city would have to pay up to $80 million for radios and transmitters.

Oakland County, Mich., declined to join Michigan's new $220 million Motorola digital system. Instead, it built its own $43 million M-A/Com network. Among other concerns, county officials said they feared they'd be forced to cede control to state officials in emergencies and share some frequencies with nearby counties.

Other obstacles:

•**Training and planning.** Experts note that first responders often spend little time preparing for interagency communication. Some agencies fail to teach responders how to use gateways.

In New Orleans, city officials used three channels for emergency services after Katrina struck. But they failed to set aside separate channels to talk to other area agencies, says Dan Hawkins of Search, a non-profit consortium that aids public-safety agencies.

Two years ago, when an inmate fled from sheriff's deputies in Lincoln, Neb., deputies had to call 911. The deputies, local police and state troopers had never set up a common radio channel for communication. The inmate was on the lam two days before being captured.

•**Lack of cooperation.** Officials often use radio lingo that differs from city to city or state to state, causing confusion in emergencies, says Donald Lund, a consultant on law-enforcement technology.

Example: "10-99" has dozens of different meanings throughout Texas, from a domestic dispute to an officer going off-duty.

In New York City, a rift between police and fire officials prevented the agencies from setting up a joint command post that might have let police warnings reach firefighters. Such command posts are now required in the city. Police and fire still use separate systems. But fire commanders carry an extra radio tuned to the police band so they can talk to police if necessary.

•**Incomplete standards.** Fifteen years ago, radio manufacturers started developing a common standard, called P25. The idea was to link different radio systems.

A lack of consensus, though, has kept that standard from being finished. And manufacturers have certified some radios as P25-compliant even though they aren't, says Derrick Orr of the National Institute of Standards and Technology.

Big industry players often have little incentive to back standards that would let responders use equipment from smaller vendors, says Powell of the telecom council. No. 1 supplier Motorola disagreed, saying it's "a leading driver and proponent of the" standard.

Glimmers of hope

In some states, innovations are offering glimmers of hope. About 10 states, including Indiana, Colorado, Michigan, Minnesota and Florida, have built statewide radio systems that city and county agencies may join. Indiana got most local agencies to join by "including everyone in the design," says project head David Smith.

That network paid dividends in 2002, when a tornado roared through south-central Indiana. Thirteen agencies communicated seamlessly. Calm was restored in seven hours. By contrast, when a tornado struck the same area in 1996, incompatible systems prevented responders from talking.

Other areas, including San Diego County, Alabama and Littleton, Colo. — site of the Columbine shootings — have taken a less-costly route. They've installed gateways that link an area's radio systems. A $194,000 Raytheon JPS system in Littleton connects 36 local, state and federal agencies.

M/A-Com's radio networks bought by Denver, Oakland County and New York state have a more elaborate gateway system.

It converts disparate radio transmissions into one Internet protocol for up to hundreds of users. But gateways "require somebody to patch in the call" and use up channels, says Mike Morgan, assistant fire chief in Los Angeles County. "I look at it as an interim solution."

A longer-term answer might be software-defined radios. They could tap into various frequency bands and could be ready in three years, says Fred Frantz, a communications consultant.

Powell envisions "a system of systems." Each region would use a common network and tie in to neighboring regions or states with a gateway.

And when might that arrive?

"We'll see good headway in the next decade," he says.